MAY 4 1938

AGRICULTURAL NEWS LETTER

VOL. 6 - NO. 5 MAY, 1938

This publication gives information on new developments of interest to agriculture on laboratory and field investigations of the du Pont Company and its subsidiary companies.

In addition to reporting results of the investigations of the Company and its subsidiaries, published reports and direct contributions of investigators of agricultural experiment stations and other institutions are given dealing with the Company's products and other subjects of agricultural interest.

DU PONT

REG. U.S. PAT. OFF.

ISSUED BY PUBLIC RELATIONS DEPARTMENT, E. I. DU PONT DE NEMOURS & CO., INC., WILMINGTON, DEL.

Du Pont's
PARTNERSHIP
with the FARMER

DU PONT

as customer and manufacturer collaborates with the farmer

PICTURE IF YOU CAN a big parade of 22,000 giant five-ton trucks, bumper-to-bumper, stretching out over 100 miles of roadway . . . straining under loads of vegetable oils, corn and cotton, wood pulp, pine rosin and turpentine. Such a colossal caravan as this would have been needed to haul the products of forest and field purchased by du Pont in the single year 1937.

Eighty-one du Pont plants in twenty-seven states hungrily consumed two hundred twenty million pounds, converting it into scores of "BETTER THINGS for BETTER LIVING . . . THROUGH CHEMISTRY."

Some du Pont products benefit farmer and city-dweller alike—for example, motion-picture and X-ray films, rayon, anti-freeze and paints. Many, however, are primarily for the farmer. As you read in this booklet of the farm products du Pont buys . . . what du Pont provides for the farm, we believe you will share our belief that the word "partnership" best expresses du Pont's long and important association with the growers of America.

WHAT DU PONT *Buys* from the farmer

COTTON and WOOD PULP

From millions of pounds of cotton linters and wood pulp, du Pont obtains cellulose.

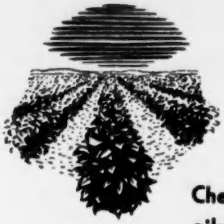
NOT LONG AGO cotton from sunny Dixie became just sewing thread, dresses and shirts. Wood from giant forests was used simply to build things—from pianos to henhouses. But the modern chemist has found other uses for cotton and wood, for they are his sources of cellulose, and cellulose, in turn, is the source of many an important chemical product—"*Cellophane*" cellulose film, which safeguards packaged goods—"*Duco*" finishes to make automobiles more beautiful—and more lastingly so—Du Pont *motion-picture film* for better entertainment; safety *X-ray film*, aiding the medical profession in its crusade against disease—*Rayon* to dress American women beautifully as well as economically—"*Pyralin*" and "*Plastacele*" plastics, serving hundreds of

uses, ranging from the beautification of automobile interiors to the handle of a toothbrush —"*Fabrikoid*" pyroxylin-coated fabrics that provide finer, more durable bookbindings, upholstery and luggage — *sporting powders to* quicken the joy of the hunt—*Cellulose Sponges* that make housework easier, bathing more luxurious—"*Cel-O-Seal*" cellulose bands to protect glass-packed goods from factory to consumer—"*Tontine*" washable window shades to help keep homes spick and span.

CORN PRODUCTS

Millions of pounds of corn products answer the demands of chemistry.

CORN, staple food of men and animals through the ages, has been brought by modern chemistry to perform a far wider range of services to mankind. Butyl alcohol is made from cornstarch, and this is used as a solvent in fine lacquers—essential to the beautification and protection of a wide variety of products—from automobiles to book ends. Cornstarch also contributes to the production of commercial *dynamite*, a boon to progress in mining, construction and—as every farmer well knows —agriculture.



VEGETABLE OILS

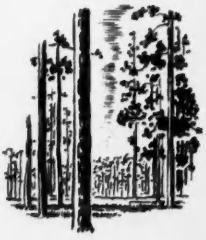
Chemistry consumes vegetable oils by the thousands of tons.

CHEMISTRY has further invaded the vegetable kingdom, for many of the finest finishes depend on the vegetable oils that serve mankind in many widely different ways. For example, "*Dulux*" finish is used on ocean liners, for gleaming white refrigerators, and bridges and other structures where extreme durability is the prime requirement.

TURPENTINE and ROSIN

Of the turpentine and rosin extracted from pine trees, a vast tonnage goes into the manufacture of paints and synthetic camphor.

FROM pine trees come essential turpentine and rosin. Camphor, used in medicines and in the manufacture of plastics from which combs, handbags, hair ornaments and motion-picture film are made, once came only from the bark of camphor trees in the Orient. Now, however, chemists can *make* camphor—from the turpentine of southern pine trees—and camphor products are available at prices far lower than heretofore.



WHAT DU PONT MAKES FROM FARM PRODUCTS

CORN PRODUCTS	Lacquers Commercial dynamite
COTTON and WOOD PULP	"Cellophane" cellulose film "Duco" finishes Motion-picture and X-ray films Rayon "Pyralin" and "Plastacele" plastics "Fabrikoid" pyroxylin-coated fabric Sporting powders Cellulose Sponges "Cel-O-Seal" cellulose seals "Tontine" washable window shades
TURPENTINE and PINE ROSIN	Synthetic Camphor: combs, hair ornaments, handbags, motion-picture film Paints and varnishes
VEGETABLE OILS	"Dulux" finishes—paints, varnishes and enamels Fatty alcohols

WHAT DU PONT *Makes* for the farmer's use

PAINTS

For protecting farm buildings and equipment.

FARM HOMES, buildings and equipment need the all-weather *protection* of fine paints. Du Pont finishes are given the severest of practical tests—exposed to sun, rain, snow, wind and hail—on outdoor test paint "farms" in several parts of the country before they are placed on the market. This, plus du Pont's never-ceasing research and experience of more than a century of paint manufacturing, suggests to the farmer:

"Safeguard your investment from depreciation and decay, with du Pont finishes. Many manufacturers of farm machinery safeguard your investment that way, for they assure all-weather protection of the farm machinery they sell you by using du Pont finishes."

WOOD PRESERVATIVES

Fire . . . termites . . . decay are resisted by well-preserved buildings and fences.

DU PONT manufactures chromated zinc chloride which wood-treating plants apply to render lumber resistant to fire, termites and decay. Lumber so treated makes superior, *safer* farm houses, barns and other buildings, and fences.

"CEL-O-GLASS" PLASTIC-COATED WIRE MESH

. . . Healthier chickens, higher egg production.

FARMERS raise healthier chickens in houses with "Cel-O-Glass" windows, and get more eggs in winter months, for "Cel-O-Glass" admits the ultra-violet sun rays that supply poultry with health-giving Vitamin D.

FERTILIZER INGREDIENTS

Nitrogen helps increase the farmer's profits.

A FEW YEARS AGO, urea nitrogen for fertilizers could be obtained only from abroad and at relatively high price. Today du Pont's urea-ammonia liquors and other products are extensively used in the manufacture of fertilizers. They make quality nitrogen available at low cost. Thus they have helped make the United States independent of foreign sources of supply and have assisted the farmer in producing better crops at lower cost.

INSECTICIDES and FUNGICIDES

Death to insects and fungi means living, thriving crops.

INSECTS and fungi, preying as much on farm profits as on farm products, are today extensively fought with du Pont chemicals . . . insecticides, fungicides and fumigants for fruits, vegetables, cotton, tobacco, shade trees, flowers and ornamentals.

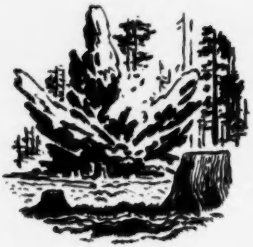
SEED-TREATING and FUMIGATION

Treated seeds . . . pest-free groves increase farm profits.

SEED-TREATING to control seed-borne diseases, to reduce seed-decay and check damping-off is accomplished with "P. A. C." Formaldehyde, "Ceresan" or "Semesan Bel."

Professional fumigators use "Hydro-Cy"—du Pont hydrocyanic acid gas to war on the pests that invade citrus groves, and sodium cyanide solutions to control cranberry root grub.

AGRICULTURAL EXPLOSIVES



The farmer blasts his way to larger crops.

IN WELL-DIGGING, irrigation, drainage and land-clearing, du Pont explosives are as important and as valuable an aid to the farmer as to the engineers who use them in mining, construction, quarrying and in other projects of progress.

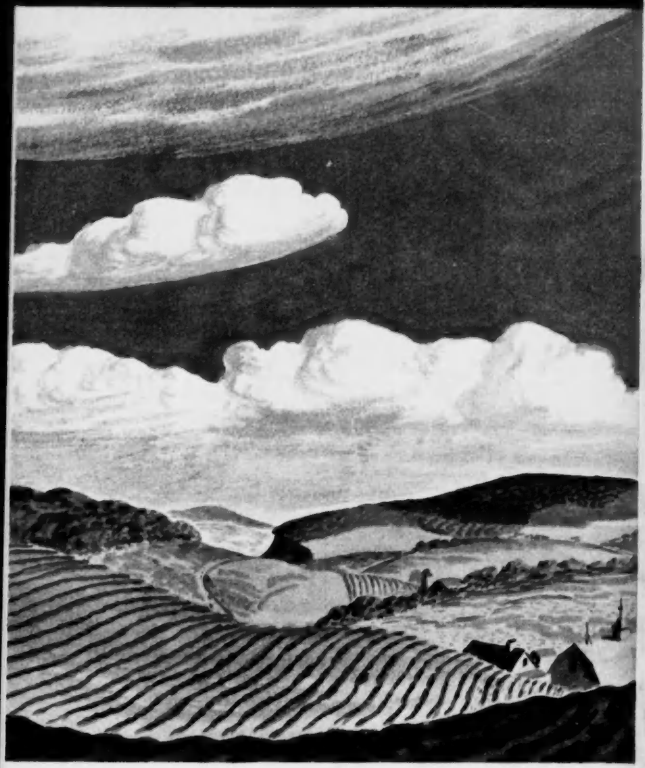
ARMS, AMMUNITION and CUTLERY

Three products that find a variety of uses on the farm.

THE FARMER who recognizes the need for protection against crows, certain kinds of hawks and owls, rats, coyotes, skunks, minks, weasels and predators finds Remington firearms low-cost insurance against them. There is a wide variety of Remington guns from which to choose. Used with Remington "Kleanbore" or Peters "Rustless" ammunition they are unsurpassed in accuracy and speed.

Too, these products afford the farmer plenty of sport while in the hunting field.

AS for cutlery, Remington knives are used on the farms of the nation for many tasks. Pocket knives, cotton samplers, turkey stickers, carvers are among the most popular. The farmer's wife is appreciative of Remington kitchen cutlery, particularly the new scientifically designed paring knives.



Better Things for Better Living . . . Through Chemistry

DU PONT

Reg. U.S. Pat. Off.

E. I. DU PONT DE NEMOURS & CO., INC.

WILMINGTON · DELAWARE

A-8215Δ

PRINTED IN U. S. A

AGRICULTURAL NEWS LETTER

Vol. 6 - No. 5 May 1938

Page

This issue contains:

The Essential Place of Research in the Development of New and Better Products for the Control of Pests 70

The Introduction of the White-Fringed Beetle in South Considered a Serious Potential Menace to Agriculture 72

Some Interesting Facts About Ants and Their Habits and Suggestions as to Effective Methods of Control 75

Texas Extension Agronomist Advises Seed Treatment as Insurance against Low and Unprofitable Yields 78

Seed Treatments for Smut of Sorghum Recommended in Circulars Issued by the University of Missouri 81

Pea Seed Treatment Results Reported from Oregon 82

Alabama Finds Treatment of Cottonseed Profitable 83

New Book Tells What Is Known About Wood Preservation 83

#########

Agricultural News Letter (du Pont)
Vol. 6, No. 5, May, 1938

THE ESSENTIAL PLACE OF RESEARCH IN THE DEVELOPMENT OF NEW AND BETTER PRODUCTS FOR THE CONTROL OF PESTS

EDITOR'S NOTE:- This is a summary of a part of a talk by Dr. Ernest B. Benger, General Assistant Chemical Director, du Pont Company, on the occasion of a visit by a group of editors of important farm publications to the Company's Experimental Station, near Wilmington, Delaware.

The development of "Loro" insecticide is an example of du Pont's contribution to agriculture which also illustrates the way in which various units of the du Pont Company contribute to a development of this type. The fact that so many departments contributed to the final success of the product is, of course, an illustration of the unique advantage of the research facilities of a large organization.

Function of the Experimental Station

The Experimental Station was assigned the problem of developing an entirely new contact insecticide as a substitute for the highly toxic nicotine and for pyrethrum and rotenone which are imported from abroad. All of our efforts were directed toward obtaining the best insecticide irrespective of raw materials. In other words, we could not be concerned in this particular problem with the utilization of any particular raw material, such as an agricultural product, because this would definitely handicap the prospects for coming out with a new insecticide of value to agriculture. Considerable attention was, however, given to agricultural sources of raw materials for the final product, and as a result of recent research there are indications that "Loro" may ultimately be obtainable from domestic oils and fats although the present source is coconut oil. (I am referring to higher fatty acids which are being developed and which may ulitmately be a source of "Lorol," from which "Loro" is made.)

Function of the Ammonia Department

The final composition chosen for development was "Lorol" rhodanate made from the long-chain alcohols obtainable by the hydrogenation of coconut oil. The commercial success of this development would not have been possible were it not for the fact that quite independently the Ammonia Department had developed a process for hydrogenating vegetable oils to obtain the long-chain alcohols in commercial quantities. It should be emphasized that the development of long-chain alcohols by the Ammonia Department had no direct connection with products of immediate benefit to agriculture, thus illustrating the difficulty of predicting the outcome of research in terms of benefit to agriculture. In so far as the production of coconut oil alcohols can be traced to the availability of a new high-pressure hydrogenation technique in this country, it can

Continued on next page

be said that the final development of "Loro" goes back to the development of synthetic ammonia.

Function of Grasselli's Pest Control Division

The development of "Loro" depended not only on the activities of the organic chemists but in large measure on the personnel and testing facilities of the Grasselli Chemicals Department. The development of an insecticide requires not only the preliminary sorting out tests but, even more important, the formulation and final evaluation of the selected insecticide and the long period of field tests necessary to determine its range of applicability and safety to various types of foliage. This requires a well-trained staff of entomologists with contacts in various parts of the country in order to determine performance under different climatic conditions. Such work necessarily requires a great deal of patience, involving field tests extending over several seasons before the final product can be marketed. "Loro" is now being widely used on greenhouse plants and is being further tested as a spray for apple orchards, as a control for insects attacking truck crops, poultry, cattle, and stored grain.

Function of the Haskell Laboratory

Before a new insecticide can be released it must be subjected to physiological tests in order to determine its toxicity to humans and dangers that might be encountered in handling the material. "Loro" was fully tested under all possible conditions involving skin applications, oral administrations, and various types of injections. In spite of its high insecticidal efficiency, "Loro" was proved to be very much less toxic than nicotine. The general problem of obtaining new insecticides less toxic to man is of increasing importance and consequently the availability of the services of the *Haskell Laboratory of Industrial Toxicology is considered an important adjunct to the insecticidal activities of the Company.

Function of the Legal Department

As can be seen from the above outline, the development of "Loro" required the cooperation of a number of Departments within the Company over a long period of time involving a very considerable research expenditure. In order to justify such expenditures from a purely business viewpoint, the Company must be assured of an opportunity to capitalize on the development through being the first to market the product. This assurance was given through the issuance of United States patents covering the development of "Loro." In spite of their many drawbacks patents continue to be a substantial incentive to the development of new products. From the standpoint of the consumer, a product patented by a reputable manufacturer is less likely to be exploited in inferior quality by unreliable producers.

---

*The Haskell Laboratory of Industrial Toxicology was established and is operated by the du Pont Company for investigations of the possible effects on health of chemical products in their manufacture and use.

"Loro", and "Lorol" are trade-marks registered in the U. S. Patent Office by E. I. du Pont de Nemours & Company, Wilmington, Delaware.

Agricultural News Letter (du Pont)
Vol. 6, No. 5, May, 1938

THE INTRODUCTION OF THE WHITE-FRINGED BEETLE IN SOUTH CONSIDERED A SERIOUS POTENTIAL MENACE TO AGRICULTURE

EDITOR'S NOTE:- Like the Japanese beetle, the alfalfa snout beetle and certain other introduced pests, the white-fringed beetle is recognized by authorities to be of considerable economic importance. This article on the insect was prepared by the United States Department of Agriculture.

Every practical way of halting and eradicating a new insect crop pest, including the use of poison dust, flame throwers, traps, and starvation, awaits the white-fringed beetle, due to reappear above ground late in June in limited areas along the Gulf Coast.

This beetle has been found in only a few scattered areas in four States--Mississippi, Florida, Alabama, and Louisiana. If, therefore, it can be kept from spreading beyond these limited areas and eradicated there, the country will be spared the cost of another insect pest capable of becoming destructive to a wide variety of crops. To this end, the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, with the cooperation of State organizations, has mapped out a campaign against the white-fringed beetle and is now testing its new fighting equipment.

The Federal-State campaign, under the general guidance of B. M. Gaddis, in charge of Domestic Plant Quarantines in the Department, will be directed from offices in Pensacola, Fla.; Florala, Ala.; Lauren and Gulfport, Miss., and New Orleans, La., with J. M. Corliss as field project leader.

Various Control Means Employed

From surveys made last year, entomologists know where to look for the beetles this year. They will also keep a careful watch for outbreaks elsewhere. The beetle grubs that hatched from eggs laid last year are now feeding on plant roots. Not much can now be done to stop them. Before they begin to come out of the ground in the known areas of infestation, however, the surface will be stripped of vegetation wherever possible. Oil will be used on ground that can be kept out of cultivation. The oil not only destroys plant life, but probably will prevent the emergence of some adult beetle from the grubs, especially where the soil is saturated. Chemical weed killers will be used -- nonpoisonous ones where there is danger to man or animals. Deprived of fresh, green food, the starved adults lay no eggs and die within a few days.

Many miles of permanent barriers -- trenches and furrows -- around infested farms and along the highways, last year halted the migrating beetles, which

Continued on next page

cannot fly. These barriers are reconditioned from time to time and many new ones supplemented by metal barrier strips, will be built this year. The trapped beetles are killed in large numbers by daily applications of kerosene or other chemicals.

Selective planting is an important defense measure against the white-fringed beetle. Farmers who are cooperating fully in the Federal-State campaign for the preservation of their crops are being advised on what crops to plant and how to space them to permit effective control work on agricultural land. Department studies show that the adult white-fringed beetle has no great appetite for corn. In heavily infested fields, therefore, corn stands a better chance of giving fair yields than peanuts, sweet potatoes, velvet beans, or other plants favored by the beetles. Interplanting of corn or other crops with velvet beans or other similar crops is discouraged. Small patches of cotton make effective traps. The beetles that collect on them can be killed by spraying or dusting with calcium arsenate, found to be an effective poison for this pest.

Flame throwers will be used wherever practicable to destroy bands of migrating beetles. If as effective as expected, they will be used every ten days throughout the period when adult beetles are migrating. Every precaution, of course, will be taken against fire hazards in forests or near buildings.

Quarantine regulations designed to prevent the transportation of infested products from the regulated areas have been enacted by affected States and they are being strictly enforced.

An extensive survey will be made throughout the southern States, especially the coastal areas, as soon as the beetles begin to emerge. State plant pest-control officials and county agents will cooperate in this program.

A Description of the Insect

The full-grown white-fringed beetle (Naupactus leucoloma) is about half an inch long and one-seventh inch wide. It is stout and heavy, with a snout shorter and broader than that of the boll weevil. It is gray, with a whitish stripe or fringe along each side. Its black eyes are conspicuous on the side of a broad gray head resembling somewhat that of a small mouse. When disturbed on a plant or on the soil, the beetle plays possum.

White-fringed beetles do most of their damage as larvae -- half-inch long, yellowish-white, fleshy grubs, somewhat curved and sparsely covered with hair. These grubs, which live entirely underground, feed on the roots of cotton, corn, peanuts, velvet beans, sugar cane, cabbage, sweet potatoes, and other plants. Most of the plants on which the grubs have fed wither and die very soon. Those that survive never yield good crops.

There are no male white-fringed beetles. All are females, capable of laying eggs. Hence one beetle can start an infestation.

Continued on next page

So far as entomologists have been able to determine, the white-fringed beetle first came to the United States sometime within the last seven or eight years, probably on shipments of produce from South America.

Though handicapped by lack of information on the beetle, its habits, and how to control it, the U. S. Department of Agriculture at once put into effect all the measures that might be expected to stop the insect's spread. At the same time it established a special laboratory at Florala, Ala., under the direction of H. S. Young of the Bureau of Entomology and Plant Quarantine, to conduct the necessary research on which to base control measures.

Agricultural News Letter (du Pont)
Vol. 6, No. 5, May, 1938

SOME INTERESTING FACTS ABOUT ANTS AND THEIR HABITS AND SUGGESTIONS AS TO EFFECTIVE METHODS OF CONTROL

EDITOR'S NOTE:- It is believed that the information on ants presented here will be of value to extension workers and others in contact with farm women. Possible uses include circulars, radio talks, newspaper articles and addresses to community groups. This discussion is from a talk by Dr. Dietz at a meeting in Wilmington, Delaware. Facts about termites were given in the March, 1938, issue of this publication.

By Harry F. Dietz, Entomologist,
Pest Control Research Laboratory,
E. I. du Pont de Nemours & Company, Inc.,
Wilmington, Delaware.

The true ants are the natural enemies of the white ants or termites, and not infrequently take possession of termite nests after a deadly, ferocious struggle in which the casualties on both sides are enormous. Solomon's remarks about going to and studying the ants become enigmatic when one actually follows them to a logical conclusion. Ants are perhaps the most predatory insects, and what they want they take through sheer dint of numbers. Many species are slave-makers and get others to do their work for them. One species or even one nest is very intolerant of another nearby. Often an introduced species like the Argentine ant in the South will drive out every other species and take its place. Ants, however, are fascinating creatures except to the housewife whose larder is over-run by myriads of invaders and whose fine cake, reserve roast or ham has become defiled by them. The food of ants taken as a group is much more varied than that of man himself, and there is perhaps no human food material that is unattractive to all kinds of ants. The exact number of species occurring in Delaware is not known, but perhaps not more than ten of them are of great importance as invaders of the household. The largest species is the big black carpenter ant, one-half inch long, which may build its nests in the heavy timbers of the house. This species is not a wood or cellulose-eater, and discards the wood it excavates as sawdust. From its nests, large numbers of stout-jawed workers may go forth to all parts of the building in search of food.

Most of the ants that invade houses usually have their nests outside, generally in the soil, beneath stones, bricks, under cracked cement pavements, near the walls of the building in the lawn or in flower beds. Of course, some species can and sometimes do build nests in the walls of houses and buildings and not infrequently in the soil of unexcavated areas beneath the building. The line of foragers to and from ant nests in some cases is readily traced. Sometimes

Continued on next page

the route is long and devious so that tracing it is impossible. Hence, tracing an infestation to its nest and eliminating that nest is not always practical advice.

The Caste System in Ants

While every layman has seen worker ants and may recognize them, frequently true ants are mistaken for termites. The caste system in ants may be very simple or very complex, depending on the species. There is always, of course, the fertile egg-laying female or queen. Even in different nests of the same species, the queenly duties of reproducing the species may be shared by an indefinite number of queens. Then there are usually thousands of workers, all of them undeveloped females. The several duties within the nest, such as rearing the young from the eggs to the resting or cocoon stage, gathering food and protecting the nest itself are divided among them. In some species, as many as three distinct kinds of workers may occur. At definite times of the year, varying with the species, winged males and females or migrating forms occur in the nest. These swarm from the nest and mate, after which the females tear off their wings and start new nests or colonies. The males die. The chances for ants starting new colonies are much greater than those of termites, for ants do not require the highly specialized conditions of a constant supply of moisture or wood in contact with the ground in order to survive. Although they represent the most highly specialized of all the insects, nevertheless ants likewise appear to be the most adaptable to their surroundings. Perhaps that is why Solomon suggested a study of their ways. That is why they are so successful and of world-wide distribution. That is why even nests of the same species in different localities may vary so much in both physical characteristics and habits as to puzzle a trained entomologist.

Control Presents Difficulties

In discussing some of these problems with a friend of mine interested in the classification of ants, he remarked: "What can a poor mortal do with a mess like that?" That is why, when we attempt to control ants, we must first know something about their food habits. The permanent control of ants is theoretically logical and simple. You merely feed a cumulative poison such as sodium arsenite, thallium sulfate or tartar emetic in a suitable food to the foraging workers in a sublethal dosage that will permit them to carry it back to the nest. Here it is taken by the nurse ants and fed to the developing, helpless, blind, legless grubs, and to the queen. Any excess is stored as a reserve. These poisons, being cumulative, build up with successive feedings so that within a week or more the queen or queens and young die. Now, if the queen or queens die, others to take her place can only be reared from eggs or from very young grubs, and, if these are not available, the nest is finished. The rub lies in finding suitable food.

The household ants may be divided into two groups - those that feed on sweets and those that feed on fats or greases. The sweets-feeders will not take grease and vice versa. Therefore, ant poisons are effective only if large numbers can be attracted to the correct bait. Many a housewife has complained to me that

Continued on next page

ant baits were no good because they seemed to attract even greater numbers than she had before and none of the ants was killed as far as she could see. She had an attractive, properly prepared bait and didn't know it.

Again, I must warn you that all the poisons used in ant baits are very toxic to man. Therefore, they must be handled as such and kept away from children and domestic animals. Now, many an exasperated housewife wants immediate relief. Unless she can find the nest, pour some carbon bisulfide or gasoline into it and seal the nest shut with mud or several layers of wet burlap, the hope of obtaining both immediate and permanent relief is slight. If, in her distraction, she becomes sadistically inclined, she can use small sponges dipped lightly in a suitable bait to attract the ants, and when these pests swarm over such lures she may drop them into hot water. Or she can dust sodium fluoride around those places the ants frequent, taking care, of course, not to get it into food, for it is a poison. If a poisonous material is undesirable, she can use ground derris powder, or, in an emergency, use any one of the many common fly sprays once or twice a day. Discouraging and controlling ants pits human perserverance and ingenuity against that of the most successful of insects.

Agricultural News Letter (du Pont)
Vol. 6, No. 5, May, 1938

TEXAS EXTENSION AGRONOMIST ADVISES SEED TREATMENT AS INSURANCE AGAINST LOW AND UNPROFITABLE YIELDS

EDITOR'S NOTE:- This is a transcription of a radio talk to the farmers of Texas. The recommendations made are equally as important in other sections where the crops referred to are grown. The comments on control of cotton diseases should be of particular interest in certain States.

By E. A. Miller, Extension Agronomist,
Agricultural and Mechanical College of Texas,
College Station, Texas.

Farmers can no longer afford to overlook chemical seed treatment in crop production because low and unprofitable yields are often due to plant diseases and poor stands. Experiments and field demonstrations have shown conclusively that it is good crop insurance to treat seed with chemical dust before planting, especially since it costs so little per acre.

In addition to controlling such destructive diseases as stinking smut of wheat, loose and covered smuts of oats and barley; kernel smut of grain and sweet sorghums; and reducing losses from angular leaf spot or bacterial boll rot of cotton, chemical seed treatment is also often very helpful in obtaining better stands. The latter is particularly true with cotton and other seed such as hegari, feterita which are sensitive to cold soil. The chemical treatment destroys disease germs and molds which are often on the seed, thereby enabling better germination and preventing or reducing loss from diseases. It often means the difference between a good stand and a poor stand, especially when the soil is cold and in an unfavorable condition for quick germination.

Many young cotton plants are often killed by anthracnose and soreshin fungi. Spores of anthracnose fungus are often present on cotton-seed and attack the young seedlings. If weather conditions are not suitable for fast growth, many of the young plants are killed by the fungus. Soreshin fungi often kill a large number of seeds in the soil, even before germination has hardly begun and also between germination and emergence of the young cotton seedlings. Many other young cotton plants die from soreshin when they are from 2 to 3 inches tall. Most of these disease spores are destroyed when the seed are treated with chemical dust, thereby making it possible to secure better stands and more vigorous and more disease-free plants.

The results of experiments published in Texas Agricultural Experiment bulletin #531, show that chemical treatment with 2% "Ceresan" increased the yield of lint

Continued on next page

cotton on an average of 25% at College Station; 13% at Temple; 10% in the Brazos Bottom; and 4% at Lubbock. At ten cents per pound, the increased yield per acre amounted to $6.40 at College Station; $3.40 at Temple; $2.70 in the Brazos Bottom, and 50 cents at Lubbock. Since it costs only from 10 to 15 cents to treat a bushel of cottonseed, or from 5 to 10 cents for one acre, it can readily be seen that cotton producers cannot afford to take a chance by planting untreated seed.

Low Cost of Treatment

The cost per acre of treating corn and grain sorghum seed is almost nothing because so little seed is required per acre. On account of the low cost and the good results obtained by treating the seed, there is really no excuse for planting untreated seed. Very often there are smut spores on grain sorghum seed and if this kind of seed is planted without being treated, it will produce smutted heads which may greatly reduce the yield. This is also the case with sweet sorghum seed.

While corn smut cannot be controlled by seed treatment the stands are often improved and yields increased. We have reports of corn demonstrations where yields have been increased several bushels per acre.

Wheat, barley, and oats should always be treated before planting. It is not even safe to depend upon seed from fields that are free of smut, without treating because clean seed often become infected with smut spores at public threshing machines, combines, grain drills, etc. Therefore, seed from fields that were entirely free of smut one year, may develop smut the next year unless the seeds are treated.

The Treatments Recommended

The chemicals that have proved most effective for the various crops are as follows: For cotton, 3 ounces of 2% "Ceresan" per bushel; for grain sorghums and sweet sorghums, either 2 ounces of 50% copper carbonate or 2 ounces of 2% "Ceresan;" for wheat, 2 ounces of 50% copper carbonate or 1/2 ounce of Improved "Ceresan;" for oats and barley, 1/2 ounce of Improved "Ceresan" per bushel, or formaldehyde treatment; for corn, 2 ounces of Improved "Semesan Jr." per bushel. Many small grain growers prefer the "Ceresan" because it does not clog the grain drills which is often the case with copper carbonate. These chemicals may usually be obtained from your local seed dealer.

The seed to be treated should be placed in a container such as a barrel or oil drum having one or two baffle boards and a tight fitting lid. The container should be so arranged that it can be revolved on an axis. It should be filled only about half to two-thirds, so that the seed will fall when the container is being revolved. After the right amount of chemical dust has been sprinkled over the seed, the barrel or drum should be revolved slowly about 25 times in order that every seed will get a coating of the chemical. For small amounts of seed, any tight can or similar container may be used.

Continued on next page

The seed may be treated during spare time, and stored away until time for planting.

Remember that seed treatment is good and inexpensive crop insurance and it often pays good dividends by increasing the yields.

"Ceresan" is a trade-mark registered in the U. S. Patent Office by Bayer-Semesan Company, Inc., Wilmington, Delaware.

SEED TREATMENTS FOR SMUT OF SORGHUM RECOMMENDED IN CIRCULARS ISSUED BY THE UNIVERSITY OF MISSOURI

EDITOR'S NOTE:- The excerpts below are from the University of Missouri, College of Agriculture, Extension Service, Columbia, Missouri, March, 1938, Circular No. 379 and Circular No. 380. Those desiring further information on smut of sorghum should obtain complete copies of the circulars.

Heavy losses in yield of grain frequently occur from planting sorghum seed infected with kernel smut. The smut can easily be controlled by treatment of the seed before planting, using the copper carbonate or New Improved "Ceresan" dust treatment or the following method recommended for treating oats with formalin:

Prepare a solution of one part of 40% formaldehyde to one to two parts of water. A good method is to have the seed in bags or other containers and allow it to fall in a thin stream, spraying the pile of seed with this solution as it forms on the floor. Cover the seed for five to eight hours, then spread and air the seed thoroughly. The seed may be planted at once after this treatment or it may be rebagged for later use.

When treating with copper carbonate use full-strength dust (50% copper) at the rate of 2 to 2½ ounces of the chemical to 1 bushel of seed. Mix the dust thoroughly with the seed in a tight container. The seed may be sown at once or stored for later use without injury to germination.

When using New Improved "Ceresan" apply at the rate of one-half ounce per bushel of seed, mix in a mixing machine, or as recommended in directions on the container. The treated seed should be kept in a bin, pile, wagon box or sacks for at least 24 hours before seeding. The seed may then be stored or seeded. It is usually not best to store treated seed more than 4 weeks before seeding.

Both copper carbonate and New Improved "Ceresan" are poisonous and should be handled carefully. Do not feed seed treated with either chemical.

"Ceresan" is a trade-mark registered in the U. S. Patent Office by Bayer-Semesan Company, Inc., Wilmington, Delaware.

Agricultural News Letter (du Pont)
Vol. 6, No. 5, May, 1938

PEA SEED TREATMENT RESULTS REPORTED FROM OREGON

EDITOR'S NOTE:- This is a report of results obtained by the Oregon State College and Experiment Station, Department of Horticulture, Section of Vegetable Crops, Corvallis, Oregon.

Results of Pea Seed Treatments 1938 (January)

Observer	Variety	No. Seeds sown	Per Cent Germination "Semesan"	Copper Oxide	Check
Bouquet	Thos. Laxton	120	90	76	35
Bouquet	Thos. Laxton	30	Sterilized soil	90 per cent	
Holley	Laxton's Progress	100	48	43	3
Young	Gilbo	200	73	56	6
Morgan	Imp. Stratagem	200	70	80	10
Chow	Roger's Icer	100	72	69	29
Whitwell	Dwf. Alderman	100	64	48	21
Blosser	Hundredfold	100	86	84	45
Aitken	Imp. Gradus	100	66	63	22
Cody	Onward	100	74	65	32
Onishi	Gradus	200	92	92	52
Bailey	Thos. Laxton	200	86	87	37
Nibler	Asgrow 40	100	62	56	12
Simonds	Alderman	200	83	72	4
Mean			74.3	68.5	23.0

Explanation: Soil in which seeds were planted exposed for two weeks to cool temperatures and much rain, following which brought into the greenhouse.

Sterilized soil in lot 2 - pasteurized electrically - no seed treatment of any kind - same variety as lot on first line.

"Semesan" is a trade-mark registered in the U. S. Patent Office by Bayer-Semesan Company, Inc., Wilmington, Delaware

Agricultural News Letter (du Pont)
Vol. 6, No. 5, May, 1938

ALABAMA FINDS TREATMENT OF COTTONSEED PROFITABLE

The excerpts below are from Spring Farming, Cooperative Extension Work in Agriculture and Home Economics, Alabama Polytechnic Institute and U. S. Department of Agriculture Cooperating, Page 4, February, 1938, Auburn, Alabama.

Chemical treatment of cottonseed with mercury dust often results in much better cotton stands and yields, J. C. Lowery, agronomist, Alabama Extension Service, declares.

Experiments and farm demonstrations in several states, including Alabama, have shown this to be true, especially when poor quality seed are used and the seasons are unfavorable to growth during the seedling stage.

It is best to use organic mercury dust especially prepared for treating cotton seed for planting. It is sold under the trade name of Two Per Cent "Ceresan." "Ceresan" is used at the rate of three ounces per bushel of cotton seed. One pound will treat five and one-third bushels of seed, making the cost of the treatment around 15 cents per bushel. The dust is poisonous and should be handled with care.

NEW BOOK TELLS WHAT IS KNOWN ABOUT WOOD PRESERVATION

A new book, entitled Wood Preservation, meets a long-standing need for a treatise on the subject designated by the title. It is intended as a text for students in schools of forestry and engineering, and as a reference for those engaged in the wood-preserving industry, as well as for the use of purchasing agents and engineers concerned with the use of wood.

The complete facts of modern wood preservation practices are assembled and explained. The engineer and the architect are told what they need to know about the economies of using treated wood to avoid costly mistakes in specifying and purchasing it. Authoritative information is made available to foresters, lumbermen, agricultural engineers, treating-plant operators, home owners, and all others interested in the protection of wood against destruction by decay, insects and other agencies of deterioration.

The authors are George M. Hunt, in charge, Section of Wood Preservation, United States Forest Products Laboratory, Madison, Wisconsin; and George A. Garratt, Assistant Professor of Forest Products, Yale School of Forestry.

##########